

**IN THE SPECIFICATION:**

**Insert the following new heading between lines 1 and 2 of page 1:**

**Field of the Invention**

**Paragraph beginning at line 2 of page 1 has been amended as follows:**

The present invention relates to a near-field optical head for recording/reading information on a recording medium by utilizing the interaction of a near field light, and to a method for fabricating the same.

**Insert the following new heading between lines 5 and 6 of page 1:**

**Background Information**

**Paragraph beginning at line 24 of page 4 has been amended as follows:**

The present invention has been achieved to overcome ~~invented in the light of the~~ foregoing problems as ~~set forth~~ in the conventional art. It is an object of the invention to provide a method for forming an optical aperture easily and economically.

**Paragraph beginning at line 3 of page 5 has been amended as follows:**

The method for producing the optical aperture according to the invention comprises the steps of providing with respect to an object having a substrate, for aperture formation having a tip of conical or pyramidal shape, a stopper having almost the same height as that of the tip, and an opaque film formed on the tip, and displacing a pressing body having approximately a planar part covering the tip and at least a part of the stopper by a force having a component toward the tip to form an aperture on the point of the tip.

**Paragraph beginning at line 11 of page 5 has been amended as follows:**

Additionally, the method for producing the optical aperture according to the invention comprises the steps of providing with respect to an object having a substrate, for aperture formation having a tip of conical or pyramidal shape, a stopper having almost the same height as that of the tip, and an opaque film formed on the tip, and displacing a pressing body having a planar part to come into contact with the tip and at least a part of the stopper in the direction toward the tip to form an aperture on the point of the tip.

**Paragraph beginning at line 20 of page 6 has been amended as follows:**

Besides Furthermore, the near field optical head is characterized in that the tip and the stopper are made of the same material.

**Paragraph beginning at line 20 of page 8 has been amended as follows:**

Besides Furthermore, the aperture formation mechanism also serves as the distance-control mechanism.

**Heading at line 10 of page 12 has been amended as follows:**

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT  
EMBODIMENTS

**Paragraph beginning at line 15 of page 12 has been amended as follows:**

The method for forming the aperture of the invention will be described referring to Figs. 1 to 3. Fig. 1 is a cross-sectional diagram showing a schematic configuration of the an object or work 1000. As shown in the drawing, the work 1000 comprises a transparent layer 5 formed on a substrate 4, a tip of conical or pyramidal shape 1 and a ridge-shaped stopper 2 formed on the transparent layer 5, and an opaque

film 3 formed on the tip 1, the stopper 2 and the transparent layer 5. Additionally, the transparent layer 5 is not necessarily needed here; in that case, the opaque film 3 is formed on the tip 1, the stopper 2 and the substrate 4. Furthermore, the opaque film 3 may be deposited only on the tip 1.

**Paragraph beginning at line 8 of page 14 has been amended as follows:**

Fig. 2 depicts a diagram illustrating a state in which the opaque film 3 on the tip 1 is being plastically deformed in the method for forming the aperture. A plate 6 is placed on the work method for forming the aperture. A plate 6 is placed on the work 1000 shown in Fig. 1, the plate covers at least a part of the stopper 2 and the tip 1 and has a portion to come into contact with the tip 1 and the stopper 2 being a plane. Further, on the plate 6, a presser 7 is placed. A force  $F$  is applied to the presser 7 is placed. A force  $F$  is applied to the presser 7 in the central axis of the tip 1 and thereby the plate 6 moves toward the tip 1. Compared with a contact area of the tip 1 to the plate 6, a contact area of the stopper 2 to the plate 6 is a few hundreds to a few ten thousands times greater. Therefore, the applied force  $F$  is dispersed by the stopper 2 and consequently the

displacement of the plate 6 becomes smaller. Stated  
otherwise, the stopper 2 constitutes means for controlling the  
formation of the aperture in the tip 1 by dispersing the force  
applied by the presser 7. Since the displacement of the plate  
6 is small, the amount of plastic deformation applied to the  
opaque film 3 is very small. Additionally, the tip 1 and the  
stopper 2 only receive a very small plastic deformation. A  
way to apply the force F is such that a weight having a  
predetermined weight is raised to a predetermined distance to  
free-fall it or a spring having a predetermined spring  
constant is mounted on the presser 7 to press the spring with  
a predetermined distance. As a material for the plate 6, a  
metal such as Al, Cr, Au and W, a dielectric such as  $\text{SiO}_2$ , SiN  
and diamond, a semiconductor material such as Si, Ge and GaAs,  
ceramics materials or a material transparent in the range of  
visible light is used. Particularly, in the case that the  
plate 6 is made of a material harder than the opaque film and  
softer than the tip 1 and the stopper 2, a force that is  
applied to the tip 1 and the stopper 2 is absorbed by the  
plate 6 and thus the displacement of the plate 6 becomes  
smaller. The amount of plastic deformation of the opaque film  
3 is made smaller easily.

Paragraph beginning at line 13 of page 15 has been amended as follows:

Fig. 3 depicts a state in which the plate 6 and the presser 7 are removed after the force F has been applied. The amount of plastic deformation of the opaque film 3 is very small and the tip 1 and the stopper 2 are deformed only in a plastic deformation region. Therefore, an aperture 8 is formed at the point of the tip 1. The size of the aperture 8 is from about a few nanometers to the extent of the diffraction limit of the optical wavelength of the light passing through the tip 1. Additionally, in the description mentioned above, the plate 6 is inserted between the presser 7 and the work 1000. However, it is needless to say that the plate 6 is removed and the work 1000 is directly pressed by the presser 7 to similarly form the aperture 8. In order to enter a light to the aperture 8, the substrate 4 is etched from the side opposite to the side where the tip 1 is formed to expose a the transparent product layer 5 or at least a part of the tip 1 and thereby an entrance for light to the aperture 8 is formed. Furthermore, it goes without saying it is understood that if the substrate 4 is configured made of a transparent material 103, and thereby a process for forming the entrance for light can be omitted.

Paragraph beginning at line 7 of page 16 has been amended as follows:

In order to form the aperture by the method as set forth above, the difference between the heights H1 and H2 shown in Fig. 1 is recommended to be equal to or below 1000 nm. That is, the tip 1 may be higher than the stopper 2 or vice versa. Furthermore, the tip 1 and the stopper 2 may have the same height. Besides, in order to prevent the tip 1 or the stopper 2 from being damaged, the force F is recommended to be set smaller. In order to form the aperture by a small force F, the difference between the heights H1 and H2 is preferably equal to or under 100 nm. At this time, the stopper 2 ~~are~~ is preferably higher than the tip 1.

Paragraph beginning at line 11 of page 29 has been amended as follows:

Here, one example of the method for fabricating the near field optical head in the embodiment 2 described in Fig. 11 will be explained with reference to Figs. 14A to 14F. Figs. 14A to 14F depict cross-sectional views ~~of A-A'~~ along line 14-14 in Fig. 11. First, a transparent material is selected for a substrate 51 (Fig. 14A). Glass, quartz or an optical material transparent in the region of ultraviolet light, visible light and infrared light is suitable.

Particularly, the case of selecting a quartz substrate will be described here.

**Paragraph beginning at line 19 of page 51 has been amended as follows:**

Also, Furthermore, according to the embodiment 4, the configuration adding the aperture formation mechanism to the information recording/reading apparatus can substantially improve the reliability of the overall apparatus with some increases in costs for the aperture formation mechanism.

**Paragraph beginning at line 24 of page 51 has been amended as follows:**

Besides, Moreover, the near field optical head is incorporated into the information recording/reading apparatus without forming the aperture when fabricating the near field optical head and then the aperture can be formed by the aperture forming part.